

# 2016 UDOT RESEARCH PROBLEM STATEMENT

\*\*\* Problem statement deadline is March 14, 2016. Submit statements to Tom Hales at [tahales@utah.gov](mailto:tahales@utah.gov). \*\*\*

**Title:** Field Data for Low Temperature Cracking

**No. (office use):** 16.01.01

**Submitted By:** Pedro Romero

**Organization:** University of Utah

**Email:** romero@civil.utah.edu

**Phone:** 801-587-7725

**UDOT Champion (suggested):** Howard Anderson, Scott Andrus, Steve Anderson, Lonnie Merchant

**Select One Subject Area**

☒ Materials/Pavements

☐ Maintenance

☐ Traffic Mgmt/Safety

☐ Preconstruction

☐ Planning

☐ Public Transportation

## 1. Describe the problem to be addressed.

UDOT is working toward a balanced mix design based on performance at high and low pavement temperature and distress; rutting and stripping were addressed some years ago with the implementation of the Hamburg Wheel Tracking Device. This effort has skewed the mix toward stiff, cracking prone designs. An effort is underway by UDOT and nationally to pull mixes back toward the center where cracking issues are balanced with rutting. Previous phases of this effort have involved the investigation of both intermediate and low temperature cracking. The mix sliver BBR test has shown great success in being repeatable and has been made an AASHTO provisional standard. This is perhaps, the first time that a UTRAC funded project has resulted in a national specification

With the testing of BBR slivers standardized by AASHTO, the next step is to understand the state of mixes being produced in the State of Utah so that a limit/specification can be set to ensure quality, long lasting pavements. It is important that UDOT knows what is being produced in the state.

## 2. Explain why this research is important.

Early cracking distress in pavements is being observed in many pavements in the UDOT system. This distress has widely been attributed to low virgin binder content driven by SuperPave designs and high levels of binder replacement due to the use of Recycled Asphalt Pavement. This early distress behavior causes the road surface to open and water to penetrate. Softening of the base pushes the pavement into early failure. The superior ride that asphalt pavements are known for, suffers as does customer satisfaction.

## 3. List the research objective(s):

1. Determine the low temperature properties of mixes being placed in the State of Utah
2. Develop a limit/specification that can realistically be implemented

## 4. List the major tasks:

1. Collect the samples that are already prepared as part of the volumetric mix verification on new projects
2. Collect loose mix from the producer
3. Determine the low temperature characteristics of the mixtures, as placed in the field and as being produced in the silo lift by testing them using the Bending Beam Rheometer
4. Proposed a specification/limit
5. Prepare a report

## 5. List the expected results:

1. It is expected that this results will provide the low temperature properties of the mixes being placed on Utah roads
2. It is expected that by measuring the low temperature characteristics of the materials, UDOT will be able to improve the performance of the roads resulting in substantial monetary savings

**6. Describe how this research will be implemented.**

Information from this study will be used to help set minimum mix design standards. The test has the potential to supplement volumetric standards and to tie field performance to lab results. Eventually, recipe-type specifications can be eliminated allowing for innovation and better performance

**7. Requested from UDOT:** \$60,000  
**Total Cost:** \$ 90,000  
(or UTA for Public Transportation)

**Other/Matching Funds:** \$30,000 (Mountains Plain Consortium)

**8. Outline the proposed schedule, including start and major event dates.**

Project to begin when funding is available. Historically this is around March 2017.  
Samples are taken during the 2017 paving season  
Testing of samples to begin June 1, 2017 and ends December 2017  
Results available Spring 2018  
Final Report available Summer 2018